-METASYS®

Output Solenoid Valve Function Module

Introduction **Page 3**

- *Description* 3
- *Application* 4
- *Capabilities* 4
- *Theory of Operation* 5
- *Specification* 6

Installation Procedures **7**

- *General Information* 7
- *Typical* 7
- *Physical Installation* 8

Commissioning Procedures **9**

- *Physical Verification* 9
- *Software Verification* 9

Troubleshooting Procedures **11**

- *Troubleshooting Chart* 11
- *Ordering Information* 13

© 1993 Johnson Controls, Inc.
Order No. 636-055

Introduction

Description

The Output Solenoid Valve (OSV) Function Module is an interface between the DCM and field devices. This function module provides 3-way solenoid air valve for control of a pneumatic output signal to field devices. The OSV features:

- 3-way solenoid air valve and interface logic to enable the DCM to control field devices through the function module
- Auto/Manual (A-M) switch for manual control
- feedback indication of the Auto/Manual switch setting to the DCM

The OSV Function Module plugs into any of the bottom ten slots associated with the DCM. Figure 1 shows typical function module locations in the NCU. A five slot panel is pictured.

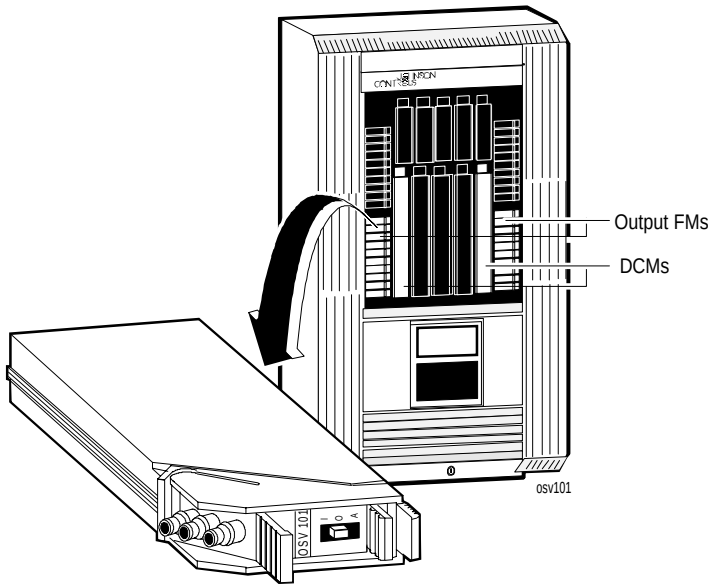

Figure 1: OSV Function Module Locations

Application

The OSV Function Module is typically used:

- to switch pneumatic control signals

Capabilities

Table 1: OSV Function Module Capabilities

Capability	Description	Purpose
Input from DCM	DCM inputs a digital, pulsed command.	Allows DCM to provide automatic control of outputs.
Auto/Manual Toggle Switch and Two Momentary Pushbutton Switches	Switch selects one of: - Auto—DCM control of outputs. - "0"—Manually produces N.O. connection - "1"—Manually produces N.C. connection	Allows for manual override of DCM control for special situations.
Power on Reset	At low power or after power up, solenoid is de-energized.	Provides controlled restart.
Output to Field	Module provides valve control on two pneumatic ports with respect to a common port: - N.C. port - N.O. port	Provides valve closure control between field device lines.

Theory of Operation

Figure 2 is a simplified function diagram of the OSV Function Module.

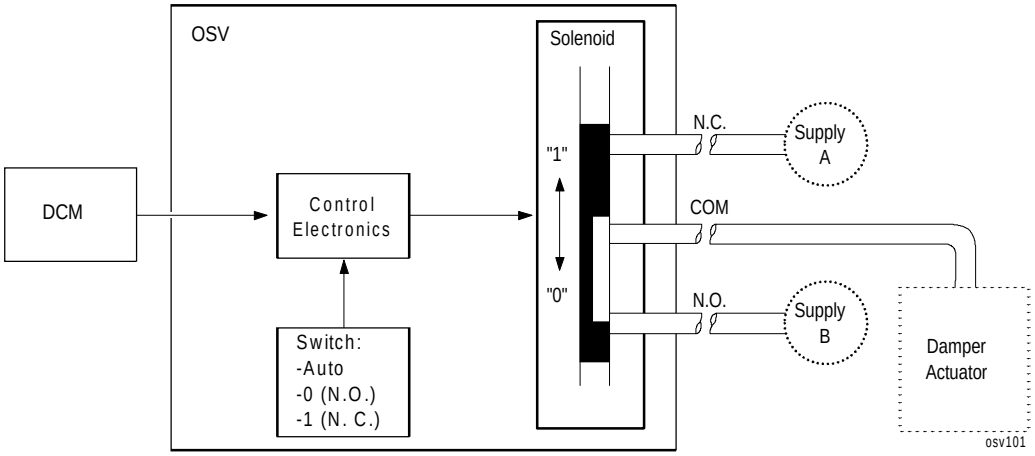

Figure 2: OSV Function Diagram

The process is:

- A command from an operator or process is sent to the DCM.
- The DCM sends a control signal to the appropriate OSV Function Module.
- At the OSV, the signal from the DCM is electronically latched. This signal controls a solenoid. When energized, the solenoid connects the common port to the N.C. port.
- A manual switch on the OSV can override the DCM control. Position 0 connects the N.O. and the Common ports (solenoid de-energized). Position 1 connects the N.C. and the Common ports (solenoid energized). The Auto position enables control by the DCM.
- The manual switch control is electrical. It requires the DCM power supply to provide control.

Specifications

Table 2: OSV Function Module Specifications

Category	Specifications For Configurations
Product Code Number	FM-OSV101
Output Range	Two states: N.C. port connected to Common, or N.O. port connected to Common
Output Limits	Minimum output volume: 475 SCIM at 20 PSIG and 68°F, 750 SCIM typical (130 ml/sec. at 138 kPa and 20°C, 205 ml/sec. typical)
Leakage	Maximum: 1 SCIM (0.27 ml/sec.)
Pressure Rating	Maximum: 25 PSIG (172 kPa)
Default Condition	N.O. port is connected to Common
Source Power	Power is from the PWR in the NCU/NEU.
Operating Environmental Requirements	40 to 122°F (4.4 to 50°C) 10 to 90% noncondensing RH 86°F (30°C) maximum dew point
Storage/Shipping Environmental Requirements	-20 to 140°F (-29 to 60°C) 5 to 95% noncondensing RH 86°F (30°C) maximum dew point
Size	0.85 in. H x 2.6 in. W x 7.0 in. L (2.2 cm H x 6.6 cm W x 17.8 cm L)
Weight	0.5 lb (0.22 kg)
Agency Compliance	FCC Part 15 Subpart J - Class A, UL 916, CSA C22.2 No. 205
Agency Listings	UL Listed and CSA Certified as part of Metasys®

Installation Procedures

General Information

When installing and connecting function modules:

- follow NEC and local codes
- observe maximums as specified in the specification table and in these installation guidelines
- connect pneumatic ports to air lines only. Do not connect to steam, gas, or water lines.

Typical

Figure 3 diagrams typical connections for applications using the OSV Function Module. Connections are similar for all applications. In Figure 3, the application is damper control.

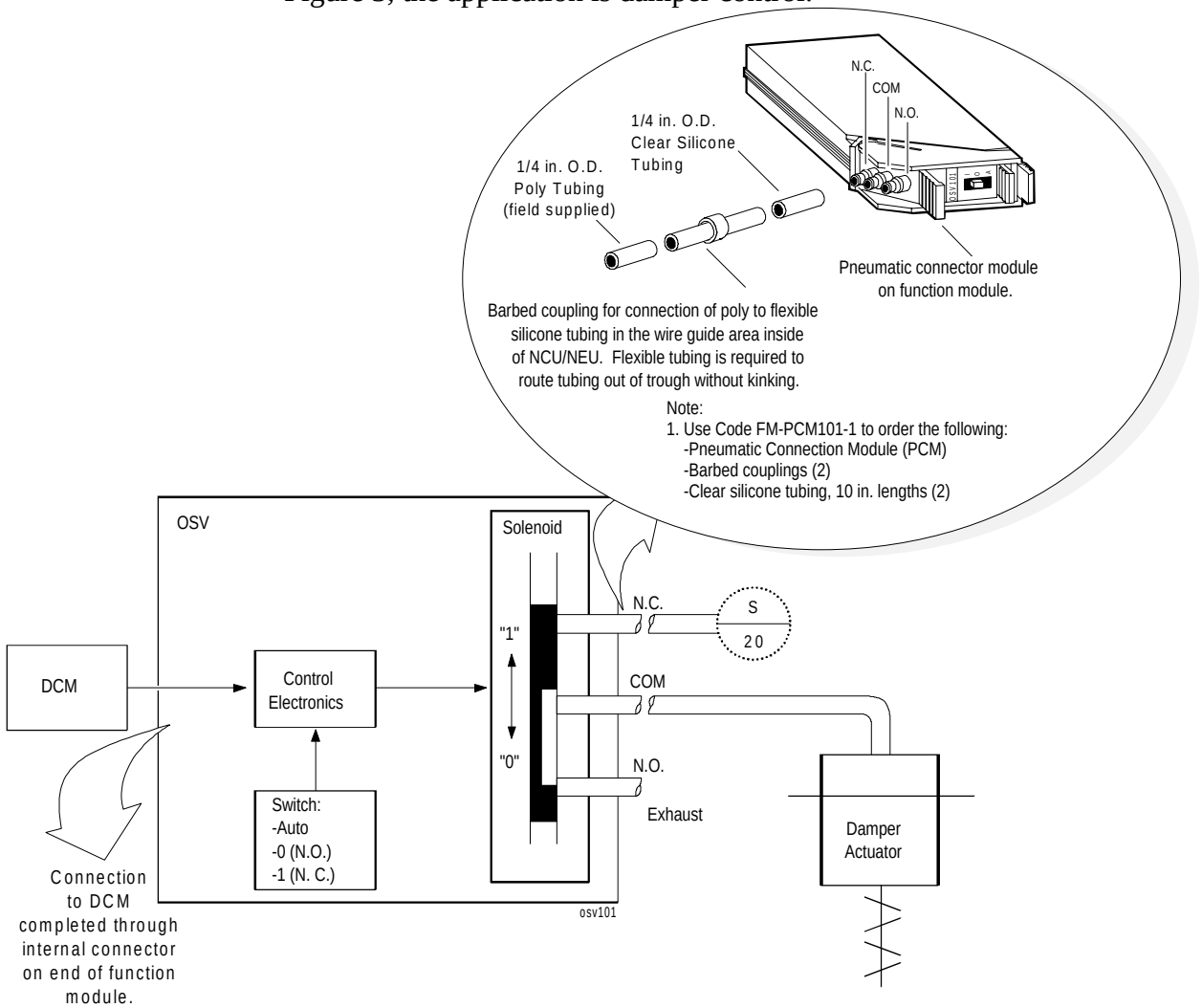

Figure 3: Connections for Typical OSV Application

Physical Installation

Assumptions

The following procedure for the physical installation of the OSV Function Module assumes:

- Panel (NCU or NEU) is installed.
- Connections to field devices are complete.
- You have engineering drawings defining details for the installation.
- You are familiar with Metasys Network terminology, and the location and operation of power switches.

Procedure

For each OSV Function Module in the network, perform the following steps.

1. Set IOA switch to I or O, so there is no output to controlled device.
2. Refer to the engineering drawings and identify the proper panel and slot number location for this module.
3. Open the latch.
4. Insert the module in the appropriate slot.
5. Install the appropriate Pneumatic Connector Module (PCM). This module should already contain connections to a field device as defined on the engineering drawings.
6. Close latch, locking PCM and function module in place.

Commissioning Procedures

Physical Verification

Assumptions

The following procedure for the physical verification of the OSV Function Module assumes:

- Physical installation at the NCU/NEU panel is complete.

Procedure

For each OSV Function Module in the network, perform the following steps.

1. Turn power supply on.
2. Adjust the manual control on the function module to Position I, solenoid valve energized. Verify that the output has switched to the appropriate device as defined in the engineering drawings.
3. Adjust the manual control on the function module to Position O, solenoid valve de-energized. Verify that the output has switched to the appropriate device as defined in the engineering drawings.

Software Verification

Assumptions

The following procedure for software verification of the OSV Function Module assumes:

- Physical installation at the NCU/NEU panel is complete, including NCM, DCM, FM, etc.
- The operating software for the network has been downloaded to the NCM controlling the panel.
- An Operator Workstation is available.

Procedure

For each OSV Function Module in the network, perform the following steps.

1. Select the System summary that includes this OSV object.
2. Set Auto/Manual switch to Auto.
3. Use the software override command, and verify that the object's Value attribute (as seen in the summary) matches the actual value for the field device.

Troubleshooting Procedures

Troubleshooting Chart

Use the diagram on the next page (Figure 4) as a troubleshooting guide. It applies for failures between point objects and field devices connected through an OSV Function Module.

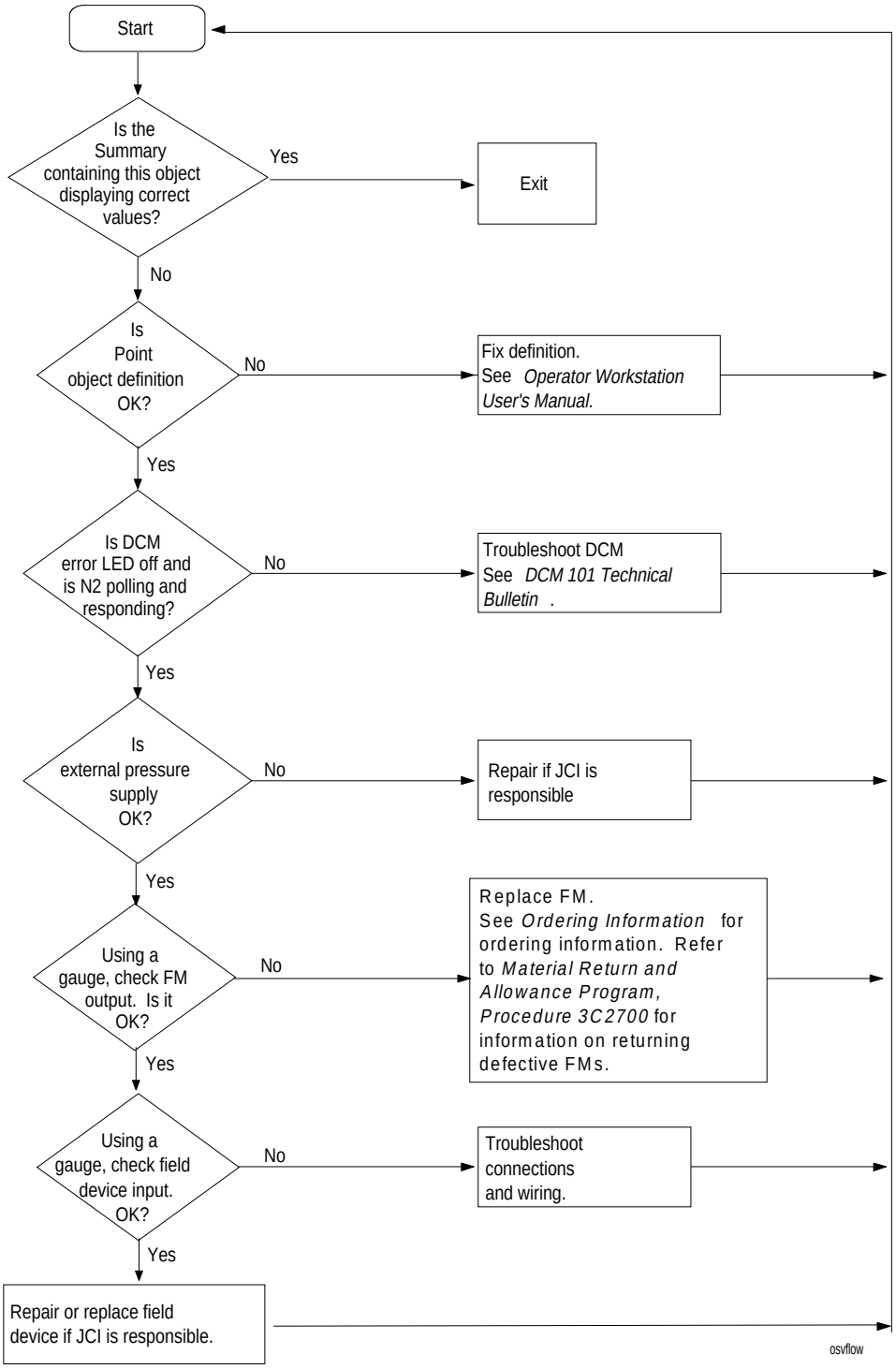
Start
Is the Summary containing this object displaying correct values?
Yes
Exit
No
Is Point object definition OK?
No
Fix definition. See Operator Workstation User's Manual.
Yes
Is DCM error LED off and is N2 polling and responding?
No
Troubleshoot DCM See DCM 101 Technical Bulletin .
Yes
Is external pressure supply OK?
No
Repair if JCI is responsible
Yes
Using a gauge, check FM output. Is it OK?
No
Replace FM. See Ordering Information for ordering information. Refer to Material Return and Allowance Program, Procedure 3C2700 for information on returning defective FMs.
Yes
Using a gauge, check field device input. OK?
No
Troubleshoot connections and wiring.
Yes
Repair or replace field device if JCI is responsible.
osvflow

Figure 4: OSV Troubleshooting

Ordering Information

Table 3: Ordering Information

Description	Product Code Number
OSV Function Module	FM-OSV101-0
Pneumatic Connector Module (Order in multiples of ten.)	FM-PCM101-0

Notes

Notes

Notes

JOHNSON CONTROLS

Controls Group
507 E. Michigan Street
P.O. Box 423
Milwaukee, WI 53201

FAN 636
Metasys Network Technical Manual
Revision 0793
Printed in U.S.A.